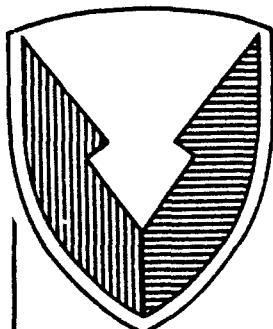


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## Technical Report

No. 13282

MAIN BATTLE TANK CREW TASK ANALYSIS

SEPTEMBER 1987

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### Summary

Results are presented of a TACOM in-house initiative detailing the duties and responsibilities of each crewmember in a four-man tank. The Abrams series main battle tank was used as a baseline for operational tasks. Typical SOP's and personal experience were then applied to tactical doctrine to complete the analysis.

### Acknowledgments

Special thanks to CPT Robert Morris and Karl Van Der Waerden for their assistance in compiling and organizing the material presented in this report.



## Introduction

SUBJECT: This report is a compendium of the tasks, duties, and responsibilities each crewmember in an Abrams series tank is expected to perform.

PURPOSE: The study was conducted as part of an in-house crew reduction effort at TACOM. Its purpose is to establish an operational baseline of the required tasks each crewmember must perform in order to effectively operate a tank in a combat environment.

The results presented are intended for use as a tool to evaluate emerging technologies as they apply to crew work load reduction.

SCOPE: The scope of this study lists the individual technical and tactical duties performed by the Loader, Driver, Gunner, Tank Commander, and a composite of the Platoon Leader and Platoon Sergeant.

Each section covers a specific crew member starting with the lowest ranking (the Loader) and ending with the Platoon Leader/Sergeant. The sections are further organized by grouping the tasks into operational families which can be found under every crewmember who takes part in the operation.

It is important to note however, that although crew tasks are arranged according to duty positions, each crewmember must be able to perform the required tasks of all his subordinates.



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## 1.0. LOADER TASK LIST

### 1.1. OPERATIONAL TASKS

Reset circuit breakers in turret networks box  
Operate NBC system/turret blower motor  
Operate emergency engine shutoff  
Ground guide vehicle  
Assist refueling tank  
Operate elevation uncouple  
Assist in boresight operations  
Prepare loader's station for operation<sup>1</sup>  
    Open/lock loader's hatch  
    Erect crosswind sensor  
    Install loader's machinegun  
    Install antennas  
    Prepare ammunition door knee switch  
    Clear ammunition door tracks  
    Place main gun Safe/Arm handle in the Safe position  
    Verify that main gun breech is closed  
    Ensure that all other crewmembers have entered their stations  
    Unlock turret traverse lock  
    Place loader's guards in desired position  
    Report ready for power operation to tank commander  
    Wait for commander to turn on turret power  
    Turn on/adjust dome-light  
    Ensure main gun status safe light is lit  
    Turret blower switch off  
    Ensure Gun turret drive switch manual light lit  
    Turn on amplifier, AM 1780/VRC  
        Main power switch on normal mode  
        Power circuit breaker switch on  
        INT ACCENT switch on  
        Set RADIO TRANS wsitch to desired location  
    Put on and connect CVC helmet  
    Set intercom select to INT ONLY  
    Adjust seat  
    Adjust hatch  
    Install night vision viewer if required  
    Ready Report to Tank Commander  
Power down and secure loader's station<sup>1</sup>  
    Stow loader's guards  
    Remove night vision viewer (if installed)  
    Wait until main gun has been traversed to rear  
    Lock turret traverse lock

Verify main gun is clear  
Verify main gun has been safed  
Close breech  
Ensure gun turret drive is in manual mode  
Verify turret blower is off  
Ensure main gun status SAFE light is lit  
Close semi-ready ammunition door  
Close ready ammunition door  
Close hull ammunition door  
Stow coaxial ammunition belt  
Turn off amplifier switch  
Remove and disconnect CVC helmet  
Turn off dome-light  
Remove loader's machinegun  
Stow crosswind sensor  
Remove and stow antennas  
Close and lock loader's hatch

## 1.2. MAIN WEAPON FIRING TASKS

Loader's pre-fire operations<sup>1</sup>  
Ensure Main Gun is out of travel lock  
Ensure Turret Lock is unlocked  
Have Gun traversed over front fender  
Lock Turret Lock  
Remove Main Gun Muzzle Plug from end of tube  
Unlock Turret Lock  
Ensure gun turret drive is powered up  
Check replenisher fluid level  
Add/delete FRH as required  
Open breech  
Return Breech Operating Handle to upright position  
Perform a function check on the Breech  
Assist in performing a firing circuit test  
Clear main gun  
Emplace Loader's guards  
Place stub base catcher in position for firing  
Ensure Commander's foot guard is in place for firing  
Loader's firing operations  
Receive the fire command  
Open Ammo compartment door  
Identify ammunition  
Retrieve desired round from ammo rack  
Close Ammo compartment door  
Ensure Tube is clear  
Load main gun  
Arm main gun  
Ensure main gun status ARMED light is lit  
Ensure turret blower switch is ON  
Announce UP over intercom

Brace and ready another round for loading  
Loader's Misfire Procedures<sup>1</sup>  
Receive the Misfire announcement  
Ensure Main Gun is Armed  
Ensure main gun status ARMED light is lit  
On order, open Breech  
Examine Primer for firing pin indentation  
    If not indented, examine firing pin  
    If indented do next procedure  
Rotate round 180 degrees  
Spit on primer  
Reload round  
Arm main gun  
Ensure main gun status ARMED light is lit  
Ensure turret blower switch is ON  
Announce UP over intercom  
Brace for recoil  
On Order, extract round  
Dispose of IAW unit SOP  
Loader's post fire operations<sup>1</sup>  
Place SAFE/ARMED handle in safe position  
Ensure main gun status Safe light is lit  
Clear main gun  
Turn off turret blower  
Stow ammunition door knee switch  
Stow loader's guards and stub base catcher  
Ensure commander's footguard is stowed  
Remove spent stub casings  
Close turret bustle ammunition doors  
Close hull ammunition door  
Dispose of spent casings

### 1.3. SECONDARY ARMAMENT

Assemble Loader's weapon  
Disassemble Loader's weapon  
Perform a function check on Loader's weapon  
Mount, and Maintain loader's weapon  
Operate 7.62mm Loader's weapon  
Correct stoppages on loader's weapon  
Change barrels on loader's weapon  
Dispose of spent links and casings  
Load, Clear and maintain Grenade Launchers  
Engagement Targets with 7.62mm Weapon

### 1.4. AMMUNITION HANDLING TASKS

Know and load Ammo Stowage Plan  
Inspect and maintain Ammo Stowage Compartments  
Stow, Inspect, and Maintain all Ammunition

Assist in ammunition breakdown  
Recognize ammunition and uses

#### 1.5. MAINTENANCE TASKS

Inspect Turret hydraulics  
Inspect hydraulic system reservoir  
Help inspect and maintain Track and Suspension system  
Check fire bottle pressure gauges  
Clean all fire sensor lenses  
Check engine and transmission fluid levels  
Inspect tools and BII  
Inspect and maintain ammo stowage compartments  
Inspect and maintain loader's station  
Assist other crewmen as required

#### 1.6. TACTICAL TASKS

Cuts and mounts camouflage  
Probes minefields  
Assists in NBC operations  
    Takes radiac readings  
    Uses M-8 alarm paper  
    Conducts local decontamination  
    Administers NBC antidotes as required  
Assists in consolidation and reorganization (wounded, ammo, fuel)  
Reassigns to replace casualties as necessary  
Deliberate occupation recon and security team leader  
Emplaces/retrieves concertina wire  
Assists in construction of fighting positions  
    Clears fields of fire  
    Assists in emplacement/retrieval of minefields  
    Improves fighting positions  
Assists in quartering party activities  
    Recon for opfor  
    NBC recon  
    Locates and marks obstacles and booby traps  
    Marks entrances, exits, and internal routes  
    Locate and mark vehicle position  
Assists in vehicle recovery operations  
Assists in processing of EPW's  
Assists in vehicle abandonment procedures  
Conducts local dismounted recons: fords, obstacles, etc.  
Distributes range cards  
Assists in demolition operations

#### 1.7. OBSERVATION

Observe target area of responsibility (approximately 180 degree

left side)  
Acquire I.D. and prioritize targets  
Use night vision equipment for target acquisition (pvs-2,5 etc.)  
Identify U.S. and foreign equipment

#### 1.8. COMMUNICATION

Radio watch and monitor additional net on command tanks  
Places hot loop in/out  
Operate and perform operator maintenance on receiver and  
receiver-transmitter, t/sec wiring harness, and amplifier 1780  
Communicate using visual signals

#### 1.9. SECURITY

Emplace and retrieve mines  
Sagger guard  
Air guard  
LP/OP  
Local security  
Assists in providing 360 degree security during tactical  
operations

#### 1.10 ADDITIONAL DUTIES

Assist in land navigation  
Assist vehicle commander as necessary  
Provide driver relief as necessary  
Runner/messenger  
Assists in messing activities

## 2.0. DRIVER'S TASK LIST

### 2.1. OPERATIONAL TASKS

Prepare driver's station for operation<sup>1</sup>  
Set parking brake  
Inspect fire extinguisher handles  
Ensure personnel heater is off  
Ensure night periscope switch is off  
Bilge pump switch off  
Smoke generator off  
Light switch off  
HI beam off  
Tactical idle off  
Fuel tank selector switch set to right or left front  
Fuel gauge 1/4 minimum  
Low fuel level light off  
Set fuel tank selector switch to rear  
Ensure fire extinguisher 2nd shot cover is closed  
Make sure gauges all read to the leftmost position  
Dome-light off  
Announce "Power"  
Turn on vehicle master power  
Ensure master power light is lit  
Circuit breakers on  
Fire light off  
Personnel heater light off  
Night periscope light off  
Bilge pump light off  
Smoke generator light off  
HI beam light off  
Parking/service brake light on  
Press panel lights test button  
Check electrical gauge reads 23 to 29 volts  
Cable disconnected light off  
Circuit breaker open light off  
Turret seal pressure zero  
Connect CVC helmet  
Set intercom selector switch to INT only  
Adjust driver's seat  
Adjust periscopes  
Close and lock driver's hatch  
Adjust T bar  
Close drain valves  
Ready report to tank commander

**Engine starts and checks<sup>1</sup>**

Set transmission control to neutral  
Have loader turn amplifier (1780) off  
Announce "Fire in the hole"  
Press engine push to start button  
Engine started light, lit momentarily, then turns off  
Warning and caution lights off  
Have commander turn NBC main system off  
Parking brake system pressure gauge 1,000-1,700 psi  
Press service pedal  
Release parking brake  
Place transmission control in D position  
Twist throttle handles slowly rearward RPM 1,450-1,550  
    tank should not move  
Twist throttle control forward, place tank in neutral  
Press and let go parking break pedal  
Press and hold service brake pedal  
Place transmission in drive  
Steer left, right, center, and listen for clunking sound  
Place transmission in neutral  
Release service brake  
Report all ready to commander

**Place Tank in motion**

Press and hold service brake  
Release parking brake  
Set transmission control to needed speed range  
Release service brake  
Ensure parking/service brake light is not lit  
Move out

**Engine shutdown operations<sup>1</sup>**

Twist throttle control forward  
Press and hold service brake pedal  
Set transmission to neutral  
Ensure parking brake system pressure is between  
    1000-1700 psi  
Press and let go parking brake  
Release service brake  
Ensure parking/service brake light is lit  
Ensure NBC main system is off  
Tactical idle switch off  
Bilge pump switch/light off  
Smoke generator switch/light off  
All other auxiliary systems switches/lights off  
Lights switch off  
Engine, transmission, and fire warning lights off  
Master caution and maintenance monitor lights off  
Allow engine 2 minutes to cool down  
Set engine shutoff switch to shutoff  
Stow steer control

Power down and secure driver's station<sup>1</sup>

Personnel heater switch/light off  
Night periscope switch/light off  
Bilge pump switch/light off  
Smoke generator switch/light off  
Lights switch off  
High beam off  
Tactical idle switch off  
Set fuel tank selector switch to rear  
Open drain valves  
Record odometer reading  
Record engine hours reading  
Turn vehicle master power switch off  
Place driver's seat in closed hatch position  
Close and lock driver's hatch  
Verify turret traverse lock is locked  
Remove/disconnect CVC helmet  
Lower driver's seat back  
Raise driver's headrest  
Exit station

## 2.2. AMMUNITION HANDLING TASKS

Know and load Ammo Stowage Plan  
Inspect and maintain Ammo Stowage Compartments  
Stow, Inspect, and Maintain all Ammunition  
Assist in ammunition breakdown  
Recognize ammunition and uses

## 2.3. MAINTENANCE TASKS

Perform daily PMCS  
    Maintain operator's part of equipment record folder  
    Look for leaks  
        Fuel  
        Oil  
        Hydraulic fluid  
    Identify class of leaks: I,II,III  
        Take appropriate action  
    Examine vehicle for signs of tampering  
    Examine for damaged or missing parts  
    Maintain track and suspension  
        Adjusting link assembly  
        Track tension  
        Roadwheels  
        Compensating idlers  
        Hubs  
        Shock absorbers  
        Torsion bars  
        Skirts

- Support roller assemblies
- Sprocket assemblies
- Track assembly
  - Track blocks
  - End connectors
  - Center guides
  - Pins
- Final drive plugs and housings
- Muzzle reference sensor
- Batteries
- Precleaners
- Transmission oil
- Engine oil level
- Engine compartment fire extinguisher lenses
- Engine hydraulics and heat exchanger
- Fire extinguisher system
- Parking brake system hydraulic pressure
- Driver's hatch
- Personnel heater
- NBC Main system
- Driver's NBC equipment
- Inspect tools and BII
- Perform other maintenance as required

#### 2.4. TACTICAL TASKS

- Cut and mount camouflage
- Probe minefields with vehicle
- Assist in construction of fighting positions with w/out plow
- Assist in vehicle recovery operations
- Assist in vehicle abandonment procedures
- Evade an ATGM
- Protect against nuclear attack with w/out warning
- Participate in a tactical road march
- Conduct proper terrain driving
- Swim/ford a water obstacle
- Cross a bridge or a raft
- Create smoke
- Operate buttoned up
- Ascend and descend a steep grade
- Cross a vertical obstacle
- Cross a ditch
- Move in smoke
- Move during darkness
- Take action on contact
- Enter/leave an overwatch position
- Drive in Traveling formation
- Drive in Traveling Overwatch formation
- Drive in Bounding Overwatch formation
- Prepare vehicle for operations

- Assist in conduct of Fire and Maneuver
- React to indirect fire
- Occupy battle positions
- Remove an injured crewman from the vehicle
- Provide first aid as required
- Provide buddy aid to an NBC casualty
- Give the alarm for an NBC hazard
- Detect NBC contamination and conduct local decon
- Move under direct fire
- Select temporary fighting positions
- Assist in processing of EPW's
- Apply customs and laws of war
- Occupy hull down and turret down positions in primary, alternate, and supplemental fighting positions

#### 2.5. OBSERVATION

- Observe target area of responsibility (approximately 120 degree front)
- Acquire, identify, and prioritize targets
- Use night vision equipment
- Identify U.S. and foreign equipment

#### 2.6. COMMUNICATION TASKS

- Pull radio watch
- Communicate using visual signaling techniques
- Send a radio message
- Set up a hot loop

#### 2.7. SECURITY

- Emplace and retrieve mines
- LP/OP
- Assist in providing 360 degree security during tactical operations
- Assist providing local security

#### 2.8. ADDITIONAL DUTIES

- Recognize ammunition and its uses
- Dispose of spent links and casings
- Assist vehicle commander as necessary
- Train, supervise, and inspect subordinates

### 3.0. GUNNER'S TASK LIST

#### 3.1. OPERATIONAL TASKS

- Place the turret into manual operation
- Perform a manual elevation check
- Place the turret into power operation
- Perform a zero pressure check
- Manually operate gun/turret drive
- Assist in refueling tank
- Assist in vehicle recovery operations
- Assist in evacuation of wounded crewman
- Operate gunner's power control handles
- Operate GPS ballistic doors
- Power up gunner's station
- Operate GPS/GAS/TIS
- Install/remove laser safety guard
- Operate laser rangefinder
- Place main gun in travel lock

- Prepare gunner's station for operation<sup>1</sup>
- Verify that gun/turret drive switch is on manual
- Ensure loader has safed main gun
- Install coax machinegun
- Verify installation of laser safety guard
- Report ready for power operation to TC
- Wait for tank commander to power up turret
- Turn on and adjust dome-light
- Put on and connect CVC helmet
- Set intercom select lever to desired setting
- Set fire control mode to manual
- Unlock main gun travel lock
- Adjust seat
- Adjust browpads
- Adjust chestrest
- Conduct a GPS/TIS panel lights test
- Ensure hydraulic pressure gage is between 1,500 and 1,700 psi
- Ensure computer power switch is on
- Conduct a computer panel lights test
- Close and latch computer cover
- Set thermal mode switch to standby
- Verify turret traverse lock is unlocked
- Verify gun/turret drive lights at loader's station are powered
- GPS functional check
  - Check defroster switch mode
  - Set gun select switches to desired settings

Set ammunition select switch to desired setting  
Open GPS ballistic doors  
Set FLIR/CLEAR/SHTR switch to CLEAR

Adjust GPS

Adjust reticle knob  
Set fire control mode switch to NORMAL  
Focus GPS eyepiece  
Adjust NORMAL MODE DRIFT knobs

Computer self test

Ensure computer power switch is on  
Squeeze and hold gunner's power control handles  
Press and release test push button  
Ensure display says pass

Computer data check<sup>1</sup>

Press/release AMMO TEMP key  
Press/release ENTER key  
Press/release BARO PRESS key  
Press/release ENTER key  
Press/release AIR TEMP key  
Press/release ENTER key  
Press in MRS switch and ensure light is lit  
Press/release boresight key  
Press/release ENTER key  
Ensure MRS switch is out and the light off  
Press/release boresight key  
Press/release ENTER key  
Set gun select switch to coax and ensure light is lit  
Press/release AMMO SUBDES key  
Press/release ENTER key  
Press/release BS ADJUST key  
Press/release ENTER key  
Press/release ZERO key  
Press/release ENTER key  
Set gun select switch to main and ensure light is lit  
Set AMMO SELECT switch to SABOT and ensure light is lit  
Press/release AMMO SUBDES key  
Press/release ENTER key  
Press/release BS ADJUST key  
Press/release ENTER key  
Press/release ZERO key  
Press/release ENTER key  
Set AMMO SELECT switch to HEAT and ensure light is lit  
Press/release AMMO SUBDES key  
Press/release ENTER key  
Press/release BS ADJUST key  
Press/release ENTER key  
Press/release ZERO key  
Press/release ENTER key

Close and latch computer cover

Checkout TIS<sup>1</sup>

Set FLTR/CLEAR/SHTR switch to SHTR  
Set POLARITY switch to white hot  
Set thermal magnification lever to 3x  
Set unit test pattern switch to PCU - fault light off  
Ensure no test patterns visible in image display  
Set unit test pattern switch to ICU - fault light off  
Ensure upper right hand corner of display is dark and no symbols displayed  
Set unit test pattern switch to EU - fault light off  
Set THERMAL MODE SWITCH to ON  
Ensure displayed fault light goes off within 5 sec.  
Ensure corner markers and symbols displayed in image  
Set thermal magnification lever to 10x  
Ensure moving reticle and symbols visible  
Check that TRU ready light is ON  
Set unit test pattern switch to TRU  
Ensure fault light goes out within 5 sections  
Verify image has reticle in center, verticle bar, and symbols visible  
Turn and verify CONTRAST knob function  
Turn and verify SENSITIVITY knob function  
Turn and verify RETICLE knob function  
Flip POLARITY switch from WHITE HOT to BLACK HOT and verify function  
Lay on a target at least 1,000 meters away  
Adjust CONTRAST knob  
Adjust SENSITIVITY knob  
Adjust FOCUS knob  
Manually enter 2680 into computer  
Adjust SYMBOLS knob  
Set thermal magnification lever to 3x  
Place THERMAL MODE switch to desired setting  
Place thermal ballistic door in desired position  
Set FLTR/CLEAR/SHTR switch to CLEAR

Adjust Gunner's Auxiliary Sight (GAS)

Turn on reticle brightness knob if required  
Lay on a target  
Adjust focusing ring  
Set filter knob to desired position  
Set reticle select knob to desired position

Check lead system

Verify that fire control switch is in normal mode  
Verify that GUN SELECT switch is set to MAIN  
Set AMMUNITION SELECT switch to HEAT  
Verify magnification lever is set to 10x

Verify FLTR/CLEAR/SHTR switch is set to CLEAR  
Squeeze and hold gunner's power control handles  
Manually enter 2,000 meter range into computer  
Rotate gunner's power control handles left & right  
Verify that reticle moves  
Rotate gunner's power control handles back to center  
Ensure turret moves when handles are centered

Check firing circuits<sup>1</sup>

Have loader set GUN/TURRET DRIVE switch to MANUAL  
Have loader close the breech  
Install firing circuit tester  
Have loader place SAFE/ARMED handle in ARMED position  
Ensure GUN SELECT switch MAIN light is lit  
Operate master blaster and observe circuit tester flash  
Press trigger on manual elevation crank and observe flash  
on circuit tester  
Have loader turn on power to gun/turret drive  
Have loader verify FIRE CONTROL switch is set to NORMAL  
Press triggers on gunner's power control handles and  
observe flash on circuit tester  
Lock turret traverse lock  
Press triggers on gunner's power control handles  
Observe that light on circuit tester does not flash  
Unlock turret traverse lock  
Lock main gun elevation travel lock  
Press triggers on gunner's power control handles  
Observe that light on circuit tester does not flash  
Unlock main gun elevation travel lock  
Place GUN SELECT switch in TRIGGER SAFE position  
Press triggers on gunner's power control handles  
Observe that light on circuit tester does not flash  
Place GUN SELECT switch in MAIN position  
Place GUN/TURRET DRIVE in MANUAL position  
Press triggers on gunner's power control handles  
Observe flash on circuit tester  
Stow circuit tester  
Have loader place SAFE/ARM handle in SAFE position

Crosswind sensor check

Have loader erect/cover crosswind sensor  
Manually enter 5 degree cant into the computer  
Press and release CROSSWIND key  
Verify that computer shows less than 3 mph  
Close and latch computer cover  
Have loader uncover crosswind sensor  
Give ready report to tank commander

Gunner's pre-fire operations<sup>1</sup>

Set GUN SELECT switch to TRIGGER SAFE

Ensure TRIGGER SAFE light is lit  
Set AMMUNITION SELECT switch to proper setting  
Ensure proper ammunition light is lit  
Enter computer manual inputs  
Update MRS  
Load coax  
Place chestrest in firing position

Gunner's main gun firing operations  
Set GUN SELECT switch to MAIN  
Ensure MAIN light is lit  
Verify that proper AMMUNITION SELECT light is lit  
Remove laser safety guard  
Arm 1ST RTN/LAST RTN laser RANGE switch  
Identify and track target  
Depress laser range button  
Announce "on the way!" and squeeze trigger

Gunner's coax firing operations  
Place machinegun manual safety in "F" position  
Set GUN SELECT switch to COAX  
Ensure GUN SELECT light is lit  
Identify and track targets  
Announce "on the way!" and squeeze trigger

Gunner's post fire operations  
Check that GUN SELECT switch is in TRIGGER SAFE position  
Ensure that the TRIGGER SAFE light is lit  
Ensure that laser RANGE switch is SAFE  
Install laser safety guard  
Clear coaxial machinegun  
Stow chestrest

Power down and secure gunner's station  
Remove coax  
Close and latch computer cover  
Turn THERMAL MODE switch to OFF position  
Set GUN SELECT switch to TRIGGER SAFE position  
SAFE laser RANGE switch  
Install laser safety guard  
Close GPS ballistic doors  
Stow chestrest  
Lock main gun elevation travel lock  
Disconnect and remove CVC helmet  
Turn off dome-light  
Verify turret traverse lock has been locked  
Verify main gun has been safed

### 3.2. MAIN WEAPON TASKS

Safe/Arm main armament  
Boresight and Zero main gun  
Apply misfire procedures  
Assemble, disassemble, and perform a function check on main gun  
Inspect the replenisher system  
Inspect and clean the bore  
Inspect and clean the bore evacuator  
Drop, inspect and clean the breech  
Fire main gun

### 3.3. SECONDARY ARMAMENT TASKS

Assemble, disassemble, and perform a function check on coax  
Install/remove coaxial machinegun  
Zero coaxial machinegun  
Manually operate coax  
Correct stoppages on coax  
Change barrels on coax  
Dispose of spent links and casings

### 3.4. AMMUNITION HANDLING TASKS

Know and load ammunition storage plan  
Stow, inspect, and maintain all ammunition  
Assist in ammunition breakdown  
Recognize ammunition and uses

### 3.5. FIRE CONTROL

Inspect the ballistic computer  
Inspect the ballistic drive  
Inspect the periscope and the infinity sight  
Inspect the telescope  
Boresight all sights  
Conduct firing circuit test  
Crosswind sensor computer check  
Update MRS  
Perform a cant unit check  
Perform a superelevation check  
Perform a lead accuracy check  
Test fire control system

### 3.6. MAINTENANCE TASKS

Replace thrown track  
Adjust track  
Inspect roadwheels and support rollers  
Inspect sprocket and track assembly

Inspect muzzle reference sensor  
Inspect turret traverse and gun elevation locks  
Inspect gunner's power control handles  
Inspect gun turret traverse and elevation servos  
Check accumulator pressure and hydraulic system reservoir  
Check auxiliary hydraulic pump  
Inspect main gun mount and recoil system  
Clean optics  
Perform a TIS check  
Perform computer self tests  
Perform computer data checks  
Perform laser rangefinder tests  
Perform GPS functional check  
Perform GAS functional check  
Inspect gunner's station dome light  
Maintain gunner's part of equipment record folder

### 3.7. TACTICAL TASKS

Assist in consolidation and reorganization (wounded, ammo, fuel)  
Assigned to replace casualties as necessary  
Assists in processing of EPW'S  
Makes up range cards  
Assists in demolition operations  
Assists in vehicle abandonment procedures  
Assist in vehicle preparation for nuclear strike  
React to nuclear burst  
Determine location using a military map  
Install/retrieve mines  
Administer nerve agent antidote to another crewman  
Operate an M8 chemical detection alarm/paper  
Conduct partial decontamination  
Select temporary fighting positions  
Apply customs/laws of war governing forbidden targets, tactics etc.  
Call for and adjust indirect fire  
Operate TSEC speech security equipment  
Prepare tank for fording

### 3.8. ENGAGEMENT TASKS

Index ammunition type into computer  
Laser range to target  
    Single returns  
    Multiple returns  
Know and employ the frontal fire pattern  
Know and employ the cross fire pattern  
Know and employ the depth fire pattern  
Identify and prioritize targets using all sights  
Know and react to fire commands

Engage targets using battlesight gunnery techniques  
Engage targets with precision gunnery techniques  
Engage targets from range card data  
Estimate range  
Engage a moving target(s) from a stationary tank  
Engage a moving target(s) from a moving tank  
Engage troops with coax  
Engage multiple targets with main gun and coax  
Move from a hide to a hull down position and engage targets  
Perform immediate action on a misfire main gun round  
Employ correct actions on contact

### 3.9. OBSERVATION TASKS

Observe target area of responsibility  
Assist in clearing of fields of fire  
Acquire, identify, and prioritize targets  
Identify U.S. and foreign equipment  
Operate thermal sight  
Operate daylight channel  
Identify minefield markers  
Collect and report information  
Operate GAS

### 3.10. COMMUNICATION TASKS

Perform radio watch  
Operate intercom/radio system  
Send radio messages  
Mount and perform operator PMCS on radio sets  
Use CEOI

### 3.11. SECURITY

Assists in providing 360 degree security during tactical operations  
Provide local security  
Scan from an overwatch position  
Use thermal channel during periods of limited visibility

### 3.12. ADDITIONAL DUTIES

Acting vehicle commander in TC's absence  
Perform Loader duties as necessary  
Apply first aid as required  
Perform driver's duties as necessary  
Train, supervise, and inspect subordinates

## 4.0. TANK COMMANDER

### 4.1. OPERATIONAL TASKS

Continuous operations

Enforce sleep plan

Perform stand to

All equipment is loaded and stowed

Complete precombat checks

All personnel are manning battle positions

Simultaneously start engines

Vehicles are ready to move out

Report status to commander

Operate during periods of limited visibility

Rain

Smoke

Fog

Darkness

Use night vision devices

Operate on all types of terrain

Desert

Arctic

Mountain

Forest and jungle

### 4.2. MAIN WEAPON TASKS

Fire main gun from commander's station

Apply misfire procedures

Supervise main gun maintenance

Keep track of equivalent rounds through tube/breech

Ensure main gun stays clear of obstacles

Verify presence of FRH in replenisher

### 4.3. SECONDARY ARMAMENT TASKS

Assemble, disassemble, and perform a function check on  
Commander's weapon

Mount/dismount commander's weapon

Correct stoppages

Perform maintenance on cdr's weapon

Operate commander's weapon

Load/unload and clear Commander's weapon

### 4.4. AMMUNITION HANDLING TASKS

Know and load ammunition storage plan

Stow, inspect, and maintain all ammo  
Assist in ammunition breakdown  
Recognize ammunition  
Know ammunition ranges and uses

#### 4.5. FIRE CONTROL TASKS

Perform operator's portion of fire control system checkout  
Boresight and zero all sights and weapons  
Update MRS  
Receive, interpret, and apply all fire control data

#### 4.6. MAINTENANCE FUNCTIONS

Responsible for condition of entire vehicle

##### Inspect

Visually inspect vehicle  
leaks  
Tampering  
Damage  
Missing parts  
Cleanliness  
Paint/rust  
Common areas  
Skirts  
MRS  
Final drive housings and plugs  
Precleaners  
Gunner's station  
Loader's station  
Driver's station  
Fire extinguisher handles  
Track  
Center guides  
End connectors  
Dead track

##### Check

Gunner's maintenance responsibilities  
Loader's maintenance responsibilities  
Driver's maintenance responsibilities  
Frequent maintenance areas  
Adjusting link assembly  
Track tension  
Roadwheels  
Compensating idler  
Roadarms  
Shock absorbers  
Torsion bars  
Support roller assemblies  
Hub and sprocket assemblies

Track assy  
All fluid levels  
    Engine  
    Transmission  
Replenisher  
Precleaners  
Main gun  
Secondary armament  
    Support roller assemblies

**Perform**

All maintenance as necessary  
Operator's part of equipment folder  
Verify operation  
    Commander's seat  
    Guards  
    Hatch  
    Commander's NBC system  
    Commander's panel  
    Commander's power control handle  
    GPS extension  
    Commander's weapon station  
        Commander's weapon  
        Commander's seat  
    Subordinate crew stations

#### 4.7. TACTICAL TASKS

**Offense**

**Drills**

Battle, Platoon, Company  
Action  
    Left, Right, Front, Rear  
    Contact  
    Indirect fire  
    Air attack

Understand and employ wingman concept  
Know use and employment of basic formations  
    Wedge  
    Vee  
    Echelon  
    Line  
    Column  
    Coil  
    Herringbone

Understand and use the principles of cover and concealment  
    Use proper terrain driving techniques  
    Use hull down and turret down positions  
    Camouflage personnel and equipment

Ensure light, noise, and litter discipline are

maintained  
Ensure proper security is maintained

LP/OP

Local security

Area security

Properly use 3 types of movement techniques

Traveling

Traveling overwatch

Bounding overwatch

Alternate bounds

Successive bounds

Overwatch

Vision check position security

Occupy hull down fire position

Assign areas of fire

Orienteate weapons

Search for targets

Visual/thermal

Movement

Select next position

Select routes

Determine likely enemy locations

Pre-plan actions on contact

Back down from fighting positions

Avoid skylining

Scan area for displaced features

Ensure entire movement is covered by  
overwatch element

Actions on contact

Return fire

Alert crew/unit

Report contact to commander

Defense

Receive the order

Commander's intent and concept of how battle will go

Element's role in units defense

Positions to be reconned, prepared, and occupied

Direct fire orientation

SOP's

Special instructions

Allocate time

Determine covered/concealed routes in/out of BP's

Determine likely enemy avenues of approach

Plan emplacement of obstacles

Locate battle/fighting positions

Primary

Alternate

Supplementary

Coordinate for construction of BP's

Perform pre-combat checks

Occupy battle positions  
Deliberate Occupation  
    Halt behind battle position  
    Coil  
    Conduct dismounted recon to select BP's  
    Receive sectors of fire  
    Move tank into hide position behind fighting  
        position  
    Clear fighting positions  
    Establish security  
    Prepare range cards  
    Clear fields of fire  
    Camouflage position  
    Improve position  
    Construct alternate/supplemental positions  
    Establish wire communication  
    Set up chemical alarms  
    Emplace obstacles

Hasty Occupation  
    Approach battle position from friendly side  
    Receive individual fighting positions  
    Move tank to hull down fighting position  
    Receive  
        TRP's  
        Engagement areas  
        Routes to subsequent battle positions  
        Exit routes  
    Prepare range cards  
    Back tank down to turret down position  
    Prepare to fight

Conduct the Defense  
    SOP's  
    Operation Order  
    Fragmentary Orders

#### 4.8. ENGAGEMENT TASKS

Estimate range  
Engage troops with coax  
Engage multiple targets  
Control and distribute fires  
Issue fire commands  
    Alert  
    Weapon or ammo  
    Target description  
    Location  
    Method of control (optional)  
    execution  
Create fire plans  
Determine and engage most dangerous targets first

- Suppress less dangerous targets
  - Indirect and/or direct fire
- Employ control techniques
  - Frontal fire
  - Cross fire
  - Depth fire
- Employ engagement priorities
  - Command and control vehicles
  - ADA weapons
  - Engineer assets
  - Tanks
  - Other armored vehicles
  - Dismounted infantry
- Employ firing techniques
  - Simultaneous fires
  - Alternating fires
  - Observed fires
  - Surprise targets
    - Battlesight gunnery
  - Assault fire
    - Employ all weapons simultaneously
  - Support by fire
    - Recon by fire direct/indirect
      - Known/suspected enemy locations
      - Dominate terrain overwatching choke points
      - Dominate towns or villages
      - Uncleared wooded areas
    - Provide base of fire for the attack
    - Suppressive fires
- Call for indirect fire
  - I.D. of F.O. and Warning order
  - Target location
    - Grid
    - Shift
  - Target description method of engagement / control
  - Spotting and adjusting
    - Determine OT factor
    - Adjust range and deviation

#### 4.9. NAVIGATION TASKS

- Use a map
  - Navigate by terrain association
  - Locate a point using intersection
  - Locate a point using resection
  - Identify locations using 8 digit grid coordinates
  - Identify likely avenues of approach
  - Determine accessible routes
  - Determine lines of sight
  - Conduct a map recon

- Identify terrain features
- Identify and use graphic control measures
- Reproduce and use map overlays
- Navigate during periods of limited visibility
- Use a compass

#### 4.10. OBSERVATION TASKS

- Observe target area of responsibility
- Acquire, identify, and prioritize targets
- Identify U.S. and foreign equipment
- Maintain contact with wingman

#### 4.11. COMMUNICATION TASKS (COMMAND AND CONTROL)

- Know communications responsibilities
  - Senior to subordinate
  - Supporting to supported
  - Lateral
  - Restoration
- Know use and employment of tactical commo
  - Messenger
  - Wire
  - Visual
    - Hand and arm signals
    - Flags
    - Lights
    - Pyrotechnique
- Radio
  - Know, use, and employ call signs
  - Take action on jamming
    - Disconnect antennae
    - Continue to transmit
    - Send a MIJI report
  - Know and use proper RTO procedures

#### 4.12. SECURITY

- Assists in providing 360 degree security during tactical operations
- Provide local security
- Scan from an overwatch position
- Use thermal channel during periods of limited visibility

#### 4.13. ADDITIONAL DUTIES

- Acting vehicle commander in TC's absence
- Perform Loader duties as necessary
- Apply first aid as required
- Perform driver's duties as necessary
- Train, supervise, and inspect subordinates

## 5.0. PLATOON LEADER/PLATOON SGT

### 5.1. OPERATIONAL TASKS

Continuous operations  
Enforce sleep plan  
Perform stand to  
    All equipment is loaded and stowed  
    Complete pre-combat checks  
    Simultaneously start engines  
    Vehicles are ready to move out  
    Report status to commander  
Operate during periods of limited visibility  
    Rain  
    Smoke  
    Fog  
    Darkness  
        Use night vision devices  
Operate on all types of terrain  
    Desert  
    Arctic  
    Mountain  
    Forest and jungle

### 5.2. MAIN WEAPON TASKS

Fire main gun from commander's station  
Apply misfire procedures  
Supervise Main Gun maintenance  
Keep track of equivalent rounds through tube/breech  
Ensure Main Gun stays clear of obstacles  
Verify presence of FRH in replenisher

### 5.3. SECONDARY ARMAMENT TASKS

Assemble, disassemble, and perform a function check on  
    Commander's weapon  
Mount/dismount Commander's weapon  
Correct stoppages  
Perform maintenance on Commander's weapon  
Operate Commander's weapon  
Load/unload and clear Commander's weapon

### 5.4. AMMUNITION HANDLING TASKS

Know and load ammunition storage plan  
Stow, inspect, and maintain all ammunition  
Assist in ammunition breakdown  
Recognize ammunition  
Know ammunition ranges and uses

#### 5.5. FIRE CONTROL TASKS

Perform operator's portion of fire control system checkout  
Boresight and zero all sights and weapons  
Update MRS  
Receive, interpret, and apply all fire control data

#### 5.6. MAINTENANCE FUNCTIONS

Responsible for condition of entire vehicle  
Inspect  
    Visually inspect vehicle  
        leaks  
        Tampering  
        Damage  
        Missing parts  
        Cleanliness  
        Paint/rust  
    Common areas  
        Skirts  
        MRS  
        Final drive housings and plugs  
        Pre-cleaners  
        Gunner's station  
        Loader's station  
        Driver's station  
        Fire extinguisher handles  
    Track  
        Center guides  
        End connectors  
        Dead track

##### 5.6.1. Check

Gunner's maintenance responsibilities  
Loader's maintenance responsibilities  
Driver's maintenance responsibilities  
Frequent maintenance areas  
    Adjusting link assemblies  
    Track tension  
    Roadwheels  
    Compensating idler  
    Roadarms

- Shock absorbers
- Torsion bars
- Support roller assemblies
- Hub and sprocket assemblies
- Track assemblies
- All fluid levels
  - Engine
  - Transmission
- Replenisher
- Precleaners
- Main gun
- Secondary armament

#### 5.6.2. Perform

- All maintenance as necessary
- Operator's part of equipment folder
- Verify operation
  - Commander's seat
  - Guards
  - Hatch
  - Commander's NBC system
  - Commander's panel
  - Commander's power control handle
  - GPS extension
  - Commander's weapon station
    - Commander's weapon
  - Subordinate crew stations

### 5.7. TACTICAL TASKS

#### 5.7.1. Offense

##### Drills

- Battle, Platoon, Company
- Action
  - Left, Right, Front, Rear
  - Contact
  - Indirect fire
  - Air attack

Understand and implement the fundamentals of offense

- Concentrate overwhelming combat power
- Surprise
- Speed
- Flexibility
- Audacity
- See the battlefield
- Use weapon systems to best advantage
- Shock, overwhelm, and destroy the enemy
- Provide continuous mobile support
- Be flexible

Understand and employ wingman concept  
Know use and employment of basic formations

- Wedge
- Vee
- Echelon
- Line
- Column
- Coil
- Herringbone

Understand and use the principles of cover and concealment

- Use proper terrain driving techniques
- Use hull down and turret down positions
- Camouflage personnel and equipment

Ensure light, noise, and litter discipline are maintained

- Ensure proper security is maintained
- LP/OP
- Local security
- Area security

Properly use 3 types of offensive operations.

Movement to contact

- Traveling
- Traveling overwatch
- Bounding overwatch
  - Alternate bounds
  - Successive bounds

Overwatch

- Visually check position security
- Occupy hull down fire position
- Assign areas of fire
- Orientate weapons
- Search for targets
- Visual/thermal

Movement

- Select next position
- Select routes
- Determine likely enemy locations
- Pre-plan actions on contact
- Back down from fighting positions
- Avoid skylining
- Scan area for displaced features
- Ensure entire movement is covered by overwatch element

Actions on contact

- Return fire
- Alert crew/unit
- Report contact to commander
- Develop situation through fire and maneuver

Bypass

Hasty attack

Attack by fire

Report encounter to commander

Hasty attack

Determine size, location, and composition

Position support element

Considerations

Mission

Terrain

Friendly capabilities

Enemy capabilities

Time

Position assault element

Considerations

Mission

Terrain

Friendly capabilities

Enemy capabilities

Time

Armor pure

Maneuver to last covered and  
concealed position

Suppress objective

Assault objective/shift fires

Fire all weapons

Sweep the objective

Halt on friendly side of objective

Hull down

Engage fleeing enemy/counter.

Consolidation/reorganization

Occupy hull down position

Assign sectors of fire

Estimate security

Eliminate remaining resistance

Secure EPW's

Replace injured key persons

Report status to CO

Cross level supplies

Evacuate casualties

Reload/redistribute ammo

Conduct essential maintenance

Continue mission

Armor with mechanized infantry

Maneuver to last covered and  
concealed position

Suppress objective

Assault objective/shift fires

Fire all weapons

Sweep the objective

- Dismount infantry
- Clear objective
- Halt on enemy side of objective
- Hull down
- Engage fleeing enemy/counter attack
- Consolidation/reorganization
  - Occupy hull down position
  - Assign sectors of fire
  - Est. security
  - Eliminate remaining resistance
  - Secure EPW's
  - Replace injured key persons
  - Report status to CO
  - Cross level supplies
  - Evacuate casualties
  - Reload/redistribute ammo
  - Conduct essential maintenance
  - Continue mission

Deliberate attack

Strongpoints

Breach element

Breach required obstacles

Assault element

Assault objective through breachpoint

Support element

Support by fire breach/assault

#### 5.7.2. Defense

Receive the order

Commander's intent and concept of how battle will go

Element's role in units defense

Positions to be reconned, prepared, and occupied

Direct fire orientation

SOP's

Special instructions

Apply troop leading procedures

Allocate time

Issue a warning order

Conduct a recon

Determine covered/concealed routes in/out of BP's

Request Engineer support if routes require

Determine likely enemy avenues of approach

Allocate direct/indirect fire zones

Coordinate preplots & TRP's w/FSO/FIST

Plan emplacement of obstacles

Coordinates with engineers

Locate battle/fighting positions

Primary

Alternate

Supplementary

Coordinate for construction of BP's

Perform precombat checks

Occupy battle positions

    Deliberate Occupation

        Halt unit behind battle position

        Coil

        Conduct dismounted recon to select BP's

        Assign sectors of fire

        Move tanks into hide position behind each fighting position

        Clear fighting positions

        Establish security

        Prepare range cards/fire plan

        Company/Platoon sector

            Individual tank positions

            OP's

            TRP's and engagement areas

            Obstacles

            Indirect fire targets

            Final protective fires

            Unit information

            Engagement ledger

        Clear fields of fire

        Camouflage position

        Improve position

            Construct alternate/supplemental

        Coordinate with adjacent units

            Location of

                Primary positions

                Secondary positions

                Alternate positions

                Sectors of fire

                Dead space between units

                How it will be covered

                Routes in and out of BP's

                OP's

                Obstacles

                CEOI information

        Establish wire communication

        Set up chemical alarms

        Emplace obstacles

    Hasty Occupation

        Approach battle position from friendly side

        Point out individual fighting positions

        Move tanks to hull down fighting positions

        Point out

            TRP's

            Engagement areas

            Routes to subsequent battle positions

            Exit routes

Prepare range cards  
Back tanks down to turret down positions  
Prepare to fight  
Conduct the defense  
Initial battle  
Employ all available fires to best advantage  
Artillary/mortars first  
Attack helicopters/tac air next  
ATGM's  
Direct fire  
SOP's  
Movement to alternate/supplementary BP's  
Covered  
By tanks  
By section  
Uncovered  
By platoon  
Request smoke  
Movement to subsequent battle positions  
Maximize firepower to suppress enemy  
Use an obstacle to slow enemy advance  
Back out of fighting positions  
Keep a terrain feature between moving tanks and enemy  
Keep main gun orientated in direction of enemy  
Move quickly to next battle position  
If move is covered  
By another platoon/company  
Move as a platoon/company  
By another section  
Move as a section  
If move is uncovered  
Move by platoon  
Request smoke  
Counter attack  
Conduct a hasty attack  
Conduct a deliberate attack  
Attack by fire  
Prepare for next attack  
Reestablish security  
Ensure positions are still mutually supporting  
Replace wounded key personnel  
Process wounded/dead  
Cross level and resupply ammo  
Improve positions  
Replace obstacles if enemy has withdrawn  
Defense under adverse conditions  
Position vehicles closer to area of engagement  
Mark routes and positions  
Utilize night vision devices

Increase security  
Enforce noise and light discipline  
Ambush as often and far forward as possible

#### 5.8. Special combat operations

Relief in place

Necessary coordination

Exchange of liaison personnel  
Positions of weapons  
Exchange of sketch cards  
Exchange of fire plans  
Exchange of fire support elements  
Location of and transfer responsibility for obstacles  
Routes and guides  
Transfer excess ammo and supplies  
Communications  
Enemy situation and intelligence  
Sequence of relief  
Time of change of responsibility for area

Conduct of relief

Both units on common net  
Relieving vehicles occupy hide positions while relieved unit backs down from BP  
Exchange necessary information

Passage of lines

Conduct a recon to confirm

Location of stationary force to be passed through  
Location of contact points  
Location of passage points  
Location of passage lanes  
Attack position location  
Assembly area location  
Initial location of passing unit's combat support

Coordinate

Supporting fires  
Time of transfer of responsibility of sectors  
Troop density  
Traffic control  
Communications  
CEOI data  
Recognition signals  
Unit designations  
Stationary unit's mission and battle plan  
Enemy situation  
Friendly situation  
OP's and patrol routes  
Obstacle locations and types

Traffic control points  
Contaminated areas

5.9. ENGAGEMENT TASKS

- Estimate range
- Engage troops with coax
- Engage multiple targets
- Control and distribute fires
- Issue fire commands
  - Alert
  - Weapon or ammo
  - Target description
  - Location
  - Method of control (optional)
    - execution
- Create vehicle, platoon, and company fire plans
- Determine and engage most dangerous targets first
- Suppress less dangerous targets
  - Indirect and/or direct fire
- Employ control techniques
  - Frontal fire
  - Cross fire
  - Depth fire
- Employ engagement priorities
  - Command and control vehicles
  - ADA weapons
  - Engineer assets
  - Tanks
  - Other armored vehicles
  - Dismounted infantry
- Employ firing techniques
  - Simultaneous fires
  - Alternating fires
  - Observed fires
  - Surprise targets
    - Battlesight gunnery
  - Assault fire
    - Employ all weapons simultaneously
  - Support by fire
    - Recon by fire direct/indirect
    - Known/suspected enemy locations
    - Dominate terrain overwatching choke points
    - Dominate towns or villages
    - Uncleared wooded areas
    - Provide base of fire for the attack
    - Suppressive fires
- Call for indirect fire
- I.D. of F.O. and Warning order
- Target location

Grid  
Shift  
Target description/Method of engagement/Method of control  
Spotting and adjusting  
Determine OT factor  
Adjust range and deviation

#### 5.10. NAVIGATION TASKS

Use a map  
Navigate by terrain association  
Locate a point using intersection  
Locate a point using resection  
Identify locations using 8 digit grid coordinates  
Identify likely avenues of approach  
Determine accessible routes  
Determine lines of sight  
Conduct a map recon  
Identify terrain features  
Identify and use graphic control measures  
Reproduce and use map overlays  
Navigate during periods of limited visibility  
Use a compass

#### 5.11. OBSERVATION TASKS

Observe target area of responsibility  
Acquire, identify, and prioritize targets  
Identify U.S. and foreign equipment  
Maintain contact with wingman

#### 5.12. COMMUNICATION TASKS (COMMAND AND CONTROL)

Know communications responsibilities  
Senior to subordinate  
Supporting to supported  
Lateral  
Restoration  
Know use and employment of tactical commo  
Messenger  
Wire  
Visual  
Hand and arm signals  
Flags  
Lights  
Pyrotechnique  
Radio  
Know, use, and employ call signs  
Take action on jamming

Disconnect antennae  
Continue to transmit  
Send a MIJI report  
Know and use proper RTO procedures

#### 5.13. SECURITY

Assists in providing 360 degree security during tactical operations  
Provide local security  
Scan from an overwatch position  
Use thermal channel during periods of limited visibility



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